statistics, but a *plan* for the conduct of the business, which will hold out the promise of more economical and more efficient operation than is now the case. The Post Office departmental report contains no intimation of the present existence of such a plan; nor, on the other hand, does the telephone company's Bulletin furnish grounds for the presumption that such a plan could not be devised.

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THE DEVELOPMENT OF ALASKA BY GOVERNMENT RAILROADS

THE recent act (March 12, 1914) authorizing the President to construct a thousand miles of railroad in Alaska has again directed public attention to this little-known and, therefore, much misunderstood and much neglected Territory. Alaska has been pictured, on the one hand, as a barren polar waste valuable only to the gold and fur seeker, and, on the other, as a veritable eden with almost unlimited resources. Hence there has been much confusion of counsel as to our proper attitude toward it.

In spite of many legislative errors of omission and commission this northern colony has prospered. Its population of sixty-four thousand souls, less than forty thousand of whom are whites, purchased in 1913 domestic goods to the value of $21,097,000 together with some half a million dollars of foreign imports. They sent in return minerals and fishery products, aggregating over $36,000,000. In the forty-five years since its acquisition Alaska has produced minerals, including gold, copper, silver, and marble worth $250,000,000, fish to the value of $163,000,000, and these, with furs and the like, have brought the total value of the exports to half a billion dollars. The United States has expended for Alaska,

including federal courts, Territorial officials, roads, as well as the original purchase price, about $38,000,000, and has received in cash from seal islands, customs, public lands, direct taxes about $18,000,000.

Alaska's industrial progress, unlike that of most new lands, has been made with but little government aid to the improvement of means of communication. A coast line exceeding 22,000 miles in length is but inadequately charted and but ill provided with aids to navigation. Cable lines and radio stations are, indeed, better provided. Government aid to inland communication consists of less than 1,000 miles of wagon roads and half as much again of trails, a partially completed canal for river steamers near St. Michael's Island, about 850 miles of telegraph lines, and five radio stations, together with surveys of the principal routes of travel. Be it remembered that up to 1912 Alaska was a district without any local government except in the incorporated towns, and hence perforce had to rely for assistance on the federal government.

Under these conditions but little industrial progress could have been made were it not for the fact that the physical features of Alaska favor transportation. Its southerly seaboard, presenting a front of over 2,400 miles to the Pacific, abounds in good natural harbors, and all these, except the head of Cook Inlet, are ice-free throughout the year. A series of high ranges skirting the Pacific, indeed, forms a serious barrier to inland travel, but these mountains are broken by several transverse valleys and passes giving access to the interior. Beyond this mountain system is an area of lesser relief, a rolling upland with many broad valleys, offering no physical obstacles to lines of communication. This inland province is drained to Bering Sea by the great Yukon and Kuskokwin rivers which, with their tributaries, afford some five thousand miles of water navigable to river steamers. The northern part of Bering Sea is, however, closed by ice from November to June, and the rivers are frozen from October to June; hence this route of communication is available less than one-third of the year.

To reach Fairbanks, the industrial center of the Yukon basin, by the usual freight route, an ocean journey of 2,700 miles and an upstream steamboat trip of 1,200 miles is necessary. This transportation has to be crowded into three summer months, and the freight is from a month to six weeks in transit. Transportation charges are necessarily high and, in fact, are almost prohibitive to any industry except that of recovering placer gold from very rich deposits. Moreover, the cost of this water transportation is for many mining enterprises but part of the charge, for it is often exceeded by the cost of land transportation from head of steamboat navigation. It is not uncommon to find mining carried on where the transportation charge on all supplies and equipment exceeds $400 a ton. It has been estimated [1] that the transportation charge in 1909 for every white man, woman, and child living in the placer districts of Alaska was about $350 and that the total was about equal to half the value of the entire gold output of the year — the only product exported except a few furs. Freight rates are, however, somewhat lower at present.

Most of the improvement in means of communication is due entirely to private enterprise. Ocean and river steamship service needs no special description. Telephone lines have been built in all the important mining districts. Some wagon road and trail construction is also to be credited to private imitation or community effort. Above all, some 466 miles of railroad have been built. The history of railroad construction here needs special consideration.

It was the Klondike gold discovery of 1896 that gave the first impetus to railway construction in Alaska. The horde of gold seekers that swarmed through the passes of the Coast Range in 1897 and 1898 transported their supplies by sleds and on their backs. It is estimated that by this primitive means upwards of 30,000 tons of freight were carried inland, at a cost, allowing fair wages for the labor, of probably $15,000,000 to $16,000,000. About an equal amount of

[1] Brooks, Alfred H., The mining industry (Alaska), 1909, U. S. Geol. Survey Bull., 442, pp. 26–27, 1910.

freight was sent into the interior by steamers up the Yukon. These conditions and the world-wide excitement caused by the Klondike stampede naturally led to plans for railways. While many lines were considered, the plan took most concrete form along the routes traveled by most of the gold seekers from head of Lynn Canal to navigable waters on the Yukon. Therefore, in 1898, a railroad route was surveyed from Skagway to the Yukon over the White Pass. This line, the White Pass and Yukon, only twenty miles of which is in Alaska, followed the natural law of all pioneer railroads, that is, to connect routes of water transportation. Construction on the White Pass route was carried on rapidly, so that by 1899 it had already crossed the summit of White Pass, 20 miles from the coast, and almost as soon as any track was laid did a lucrative business in handling freight and passengers. By 1901, 110 miles of this narrow gauge railroad had been completed, and this, in connection with steamboat service on the Yukon, formed a through route of communication with the interior. This is still the only railroad communication with the Yukon.

Meanwhile, many other railroads had been projected, among which were several lines from Valdez, the most northerly open port on the Pacific, and one from Seward, a harbor 140 miles to the southwest. Most of these were planned as trunk lines into the interior. Construction began on Seward line in 1902, and about the same time work was begun on one or more lines from Valdez. An ineffectual attempt was made in 1906 to obtain legislation at Washington for exclusive rights, grants, and subsidies. The only action by Congress on Alaska railroads was the act of 1898, granting rights of way, and one of 1900, imposing an annual tax of $100 a mile on all operating railroads.

About this time a strong aggregation of capital took hold of one of the Valdez railroad projects, but later abandoned this route for Katalla, lying east of the mouth of the Copper, where a harbor had to be constructed. A year later, this too was abandoned, and a terminal at Cordova, on the east side of Prince William Sound, was chosen and a railroad projected

up the Copper Valley under the name Copper River & Northwestern. This line, which is standard gauge, was completed to the Bonanza copper mine, 198 miles from the coast, in 1911, and is so located as to serve an extensive copper-bearing district. At Chitina, 132 miles from the coast, the line bends to the eastward, leaving the main route into the interior. Near mile 38 it passes within forty miles of the Bering River coal field.

The Alaska Northern Railroad, the other standard gauge line projected as a trans-Alaska route, was completed from Seward to mile 71 in 1907, went into bankruptcy without having reached its immediate objective point, the Matanuska coal field, 115 miles beyond its present terminus.

In addition to these, several small railroads have been built to serve local needs. The longest of these is the Tanana Valley Railroad, narrow gauge, and 45 miles in length, which serves the Fairbanks gold district. In all, 466 miles of railroad have been built, but these are distributed through nine different systems. In 1913, 266 miles of this total trackage were operated as common carriers and all of these probably without profit and in most cases at an actual loss.

The outlook for the future is by no means as discouraging as the above facts would seem to indicate. Most of the railroads above described are but incomplete stubs that have not reached the possible sources of traffic. Moreover, unlike the pioneer railroads of nearly all new lands, those of Alaska have met with taxes instead of subsidies and land grants, stringent regulations instead of encouragement. The annual tax of $100 a mile is much less than the lowest in the States, but a serious matter for a pioneer line with heavy expenses and small traffic. There is also the warehouse tax of ten cents a ton on all freight, which is at least an additional discouragement. Probably all Alaska railroad corporations would welcome conditions by which they would be subject to the general corporation tax on net profits.

More serious than the taxes is the question of coal. As the coal land controversy has not yet been settled, no coal has been mined, which has forced the railroads to import Cana-

dian coal at high cost, and they have also failed to obtain the coal tonnage on which their projectors had counted. Meanwhile, the general use of fuel oil on the Pacific has so greatly curtailed the market for Alaska coal that even were the fields now open the tonnage of coal would not be as great as was reasonably expected ten years ago when these railways were first projected.

The above reasons will account for the fact that, up to the present time, railroad construction in Alaska has not been a financial success. If the projects were considered in detail, reasons for some failure might be found in matters of policy and management, but these, of course, go beyond the purpose of this writing. It then becomes pertinent to inquire whether there is any economic justification for further railway building.

The statement has frequently been made that Alaska is an unknown land, and that the great resources used as an argument for railway construction are largely figments of the imagination. Such statements are not based on fact. For a generation the prospector has searched the wilds of Alaska for mineral wealth and has met with substantial reward. For half that time the federal government has investigated the mineral resources of the Territory. Today the mining industry of Alaska gives employment to upwards of ten thousand men.

Alaska coal fields are undeveloped, but that is not due to lack of either quality or quantity of fuel. The high-grade steaming and coking coals of the Territory are unequalled by any on the Pacific slope of the continent. Some of them are, indeed, badly crushed and expensive to mine, yet even these will and must be drawn upon for the needs of the rapidly growing population of the west coast states. The most conservative estimate made of these high-grade coals indicates a billion tons of available fuel. There are also in Alaska enormous deposits of lignitic coal valuable for local use.

Besides those on the coast there are at least two important inland copper districts, from one of which commercial shipments have been made. Copper has also been found in other

inland districts. There are, of course, no data upon which any quantitative estimates of the amount of copper can be made.

Auriferous mineralization is widely distributed over Alaska, indeed occurring in an area comparable in size to any gold-bearing region of the continent. While the richest of the known placers approach exhaustion, there are still enormous deposits of gold-bearing gravel that need but cheaper transportation to throw them open to profitable exploitation. Auriferous lode deposits are also widely distributed.

Iron ores have been found in the coastal region, but are little known. It is not impossible that these, with the nearby coking coals, may lead to a smelting industry. Of other mineral wealth it is not necessary to speak except to mention the fact that silver, lead, petroleum, marble, gypsum, and tin have been produced in commercial quantities.

No fact in regard to Alaska has met with greater incredulity than has the statement of extensive areas of agricultural land within the Territory. The evidence of cattle-raising in southwestern Alaska since the Russian days, the many prosperous ranches in the Tanana Valley, the repeated wintering of stock without feeding in the upper Yukon Valley, and above all the eighteen years of agricultural experimentation on the part of the government in the Territory have been ignored. The frozen subsoil, cold winters, and the latitudinal position of the Territory have been cited as conclusive arguments against all kinds of agriculture. Such arguments ignore the fact that the same conditions prevail and have been successfully met in other parts of the world.

The fact is that the hardier grains, potatoes, vegetables, and hay have been successfully raised in many parts of the inland region. There are also luxuriant summer pastures in Alaska; but the winter pastures are limited to the upper Yukon basin. It is conservative to estimate the agricultural areas at 30,000 square miles, about two-thirds of which would be tributary to the proposed railroads, and in addition to the areas of pasture. It is not impossible that Alaska will eventually be drawn upon for a food supply for other lands, but this only

when increasing population has utilized the more fertile parts of the earth's surface. Meanwhile, given transportation, Alaska can and will supply an important part of the food of its own population that will for the present be attracted by the mineral wealth and fisheries.

The tremendous area of reindeer pastures, sufficient for millions of animals, is also a latent source of food not to be ignored. How soon it may be necessary to draw on this cannot be forecast, but that these northern tundras must eventually be utilized as a source of meat cannot be doubted.

Of commercial timber there is little in Alaska. The inland woodlands will furnish some structural material, but the best of it is but of an inferior grade. At present, in the absence of any use of the abundant supply of lignitic coal the scant forests are being rapidly devastated for use as fuel. In southeast Alaska coast region there is some excellent timber and a larger supply of pulp wood.

The fisheries are, of course, not a prospective source of railroad tonnage. They will, however, attract a population, increase the local market for food stuffs and mineral fuels, and above all cheapen ocean freight rates by giving a return cargo for north-bound vessels.

To summarize the resources: Alaska contains abundant mineral wealth and large areas of lands that can now be utilized for agriculture and grazing to supply a local market. Its reindeer pastures are a prospective source of food. Commercial timber and pulp wood occur only on the coast. The fisheries are one of the most valuable assets but affect railroad building only indirectly.

Alaska has so often been pictured as a polar region that a word about climate seems necessary. Polar climatic conditions prevail only in the northern third of the territory and this region does not enter into the present discussion. The climate of Pacific Seaboard is temperate, while that of the inland region is specially healthful. Only on the seaward slope of the coastal mountains is the snowfall heavy enough to impede railroad traffic. The extreme cold which prevails in winter beyond the coastal mountains is no more severe

than in many populated regions of the globe, and will be no barrier to permanent settlement by the white race.

The above generalization on resources, while bearing on the matter of railroad construction, does not answer the important question of visible tonnage. This matter was carefully considered by the Alaska Railroad Commission.[1] Its recommendations of a road to Fairbanks, and estimates of operation costs, are based on a traffic of only 45,000 tons, which is less than twice the average tonnage of five years. No account was taken of any possible outgoing freight, and the local freight, including coal, was estimated on a very conservative basis. Similar conservative estimates were used in regard to traffic over the other railroads recommended by the Commission. Experience has shown that the passenger traffic on Alaskan railroads is all out of proportion to freight movement, so that more liberal estimates were made of the income from this source. It was estimated that on a basis of a charge of six cents per passenger mile, and freight at 5.49 cents per ton mile, with money for construction at three per cent, the road to Fairbanks would pay operating expenses on the basis of the above traffic.[2] It will not be necessary to analyze the report of the Commission further, as this will indicate that even using the most conservative estimate of traffic the railroad should be operated without loss. If, however, the roads were financed by private capital, calling for at least 6 per cent interest, expenses could only be met by so high a freight rate as to prohibit any large commercial development. This will indicate why Government aid is required for a trans-Alaskan railroad.

But little of Alaska land has passed into private ownership, hence a policy is justified which is based on the fact that the Government is a great land holder in the Territory. Under the old policy, now happily abandoned, these lands would in part have been granted to private corporations which, by

[1] Railway Routes in Alaska, Doc. No. 1346, House of Rep., 62d Congress, 3d Session. Parts I and II, Washington, 1913.

[2] The Commission recommended 733 miles of railroad and estimated the cost of construction and equipment at $48,440 a mile. The estimated cost of the cheapest line recommended is $42,500 a mile and of the most expensive $52,300.

railway construction, in turn would make the latent wealth of these and others available. This policy having been abandoned, the only alternative is for the government to furnish the transportation. Without railways the land is valueless; with them it becomes an asset of importance. It was probably these more purely commercial considerations, as much as the opportunity to furnish a new field of activity to our people, that led to the enactment of the law providing for government railroads in Alaska. A further argument lies in the general acceptance of the principle of leasing the mineral fuels in the public lands rather than selling them. A government railroad is almost a necessary corollary of leasing mineral lands in an undeveloped field.

To turn to the act itself.[1] It provides, essentially, for a railroad or railroads in Alaska, not exceeding 1,000 miles, to connect open ports on the Pacific with the inland waterways, and coal fields over such route or routes as the President may choose. The proposed railroad or railroads may be leased for a term not exceeding twenty years, or may be operated by the government as common carriers. Existing railroads that connect with the proposed line may be either purchased by condemnation, at a price not exceeding their actual physical value, or traffic agreements may be made with such lines. Unlimited authority is given the President as to the organization of the work. He may detail officers from the Engineer Corps of the Army or Navy to the work, or carry it on solely by civilians. The Panama Canal equipment may be utilized so far as is desirable. Provision is made for reserving rights of way through all lands to which patents are in future granted. The President is also authorized to withdraw and dispose of, under such methods as he may see fit, lands useful for town sites along the routes of the railroads. The cost is not to exceed $35,000,000, and $1,000,000 is appropriated to begin the work. A separate account is to be kept in the Treasury of all receipts from the proposed railroads as well as of sale of public lands and minerals.

[1] An act to authorize the President of the United States to locate, construct, and operate railroads in Alaska, and for other purposes; approved March 12, 1914.

Congress has recognized by the wording of this act that if the government is to enter upon the new field of railway construction and operation, there can be no hope of success unless the details of working out the plan of organization and execution is left to the Executive. The plan of making the latent wealth of this great territory available to the people is one of broad statesmanship. The act itself leaves little to be desired.

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